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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,575	09/22/2003	Thiemo Marx	PO-7791/LeA 36,167	9646
34947	7590	07/18/2006		
LANXESS CORPORATION 111 RIDC PARK WEST DRIVE PITTSBURGH, PA 15275-1112			EXAMINER VIJAYAKUMAR, KALLAMBELLA M	
			ART UNIT 1751	PAPER NUMBER

DATE MAILED: 07/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/667,575

Applicant(s)

MARX ET AL.

Examiner

Kallambella Vijayakumar

Art Unit

1751

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1751

DETAILED ACTION

- Claims 3 and 4 were amended. Claims 1-5 are currently pending with the application.
- Applicant's arguments filed 04/25/2006 have been fully considered but they are not persuasive to overcome the rejections cited in the last office action for the following reasons:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Womelsdorf et al (WO 00/50503).

The US Patent 6,710,091 issued to Womelsdorf et al is being used as the English Translation of the WO 00/50503 in the present rejection.

The prior art teaches a dispersion/sol containing nanoparticles of ZnO with an average particle diameter of less than 15 nm formed by redispersing the ZnO gel in polar aprotic organic solvents such as diol or dichloromethane, and further containing triethanolamine modifier (amino alcohol) (Abstract, Col-3, Ln 5-10; Col-5, Ln 10-21, 39-48, Col-9, Example-7). The polar aprotic organic solvents are well known in the art that include common solvents such as THF, DMF, DMAC, NMP, DMSO, and acetone that meet

Art Unit: 1751

the limitation of "halogen free and water free" in the claims (See Sellinger, US 6,861,091, C-7, Ln 17-22).

All the limitations of the instant claims are met.

The reference is anticipatory.

2. Claims 1-3 are rejected under 35 U.S.C. 102(e) as being anticipated by Womelsdorf et al (US Patent 6,710,091).

The prior art teaches a dispersion/sol containing nanoparticles of ZnO with an average particle diameter of less than 15 nm formed by redispersing the ZnO gel in polar aprotic organic solvents such as diol or dichloromethane, and further containing triethanolamine modifier (amino alcohol) (Abstract, Col-3, Ln 5-10; Col-5, Ln 10-21, 39-48, Col-9, Example-7). The polar aprotic organic solvents are well known in the art that include common solvents such as THF, DMF, DMAC, NMP, DMSO, and acetone that meet the limitation of "halogen free and water free" in the claims (See Sellinger, US 6,861,091, C-7, Ln 17-22).

All the limitations of the instant claims are met.

The reference is anticipatory.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Art Unit: 1751

1. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Womelsdorf et al (WO 00/50503) in view of Takeda et al (US 6,200,680).

The composition and method of making dispersion/sol containing redispersed ZnO nanoparticles by Womelsdorf as set forth in rejection-1 under 35 USC 102(b) is herein incorporated. The prior art further teaches using the ZnO in the matrix modification of the polymers, paints and coatings, and vulcanization of rubbers and lattices (C-5, Ln 45-48).

The prior art does not disclose a molded article prepared using the dispersion per the claim.

In the analogous art, Takeda et al teach a method of making ZnO particles/dispersions with a particle size of $0.005 < \text{nm} > -10$ microns and resin molded articles containing the ZnO particles formed by adding the particles or a dispersion of particles in a solvent to a monomer or polymer (C-11, Ln 12-16, 37-40; C-15, Ln 23-36; C-20, Ln 34-42; C-24, Ln 45-65; C-25, Ln 5-12; C-71, Ln 10-25).

It would be obvious to a person of ordinary skill in the art to combine the prior art teachings to form molded articles containing ZnO dispersions/particles of Womelsdorf et al with reasonable expectation of success because the teachings are in the analogous art dealing with nanoparticles of ZnO, and the combined prior art teaching is suggestive of the claimed molded article. When the reference teaches a product that appears to be the same as, or an obvious variant of, the product set forth in a product-by-process claim although produced by a different process, the claim is not patentable. See *In re Marosi*, 710 F.2d 799, 218 USPQ 289 (Fed. Cir. 1983) And *In re Thorpe*, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985). See also MPEP §2113.

2. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Womelsdorf et al (WO 00/50503).

The composition and method of making dispersion/sol containing redispersed ZnO nanoparticles by Womelsdorf as set forth in rejection-1 under 35 USC 102(b) is herein incorporated. The prior art further teaches using the ZnO in the matrix modification of the polymers, paints and coatings, and vulcanization of rubbers and lattices (C-5, Ln 45-48).

The prior art does not disclose a coating composition comprising the dispersion per the claim.

Art Unit: 1751

It would be obvious to a person of ordinary skill in the art to form paints and coatings containing ZnO dispersions/particles of Womelsdorf et al with reasonable expectation of success because the prior art is suggestive of such an use.

3. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable Womelsdorf et al (US Patent 6,710,091).

The composition and method of making dispersion/sol containing redispersed ZnO nanoparticles by Womelsdorf as set forth in rejection-2 under 35 USC 102(e) is herein incorporated. The prior art further teaches using the ZnO in the matrix modification of the polymers, paints and coatings, and vulcanization of rubbers and lattices (C-5, Ln 45-48).

The prior art does not disclose a molded article or a coating composition containing the dispersion per the claims.

It would have been obvious to a person of ordinary skilled in the art to use the ZnO dispersions in the paints and coatings or the matrix modification of polymers or in vulcanization of rubbers with reasonable expectation of success, because the prior art is suggestive of such an use, and the instant claimed molded article would be obvious because these composite polymers and rubbers/matrix-modified-polymer are used in molded articles such as sheets (See Hagiwara et al, US 5,672,427; C-1, Ln 38-42).

Response to Arguments

Applicants argue that the prior art/s by Womelsdorf fails to teach or suggest “water- and halogen-free” zinc oxide dispersion per their claims limitation is not persuasive (Response, Pg-5, Ln 4-5,14-15). The prior art clearly teaches that the nanoparticles of ZnO are redispersible in organic solvent and/or water (C-3, Ln 8-9); and further teaches colloidal dispersion formed in organic solvents, preferably polar aprotic solvents containing surface-modifying triethanolamine (C-5, Ln 10-21). The prior art further teaches using a mixture of diol that is halogen and water free, and A reference is not limited to the working examples, see *In re Fracalossi*, 215 USPQ 569 (CCPA 1982). The polar aprotic solvents are well known art that include common solvents such as THF, dioxane, DMF, DMSO, NMP and acetone

Art Unit: 1751

(Sellinger, US 6,861,191; C-7, Ln 17-22). Applicants further argue that Takeda (US-680) teaches a method of making the ZnO particles while it does not teach dispersions in amino alcohols and does not provide motivation to combine is not persuasive (Response, Pg-7, Ln 3-5 and 12-14). Takeda's disclosure is in an analogous art teaching the composition and method of making ZnO nanoparticles/dispersions in presence of amino-alcohol additive/chelating-agent, and forming dispersions in organic solvents; and forming products including moldings containing these products, and one of ordinary skilled in the art be motivated to combine the prior art teachings of Womelsdorf and Takeda (C-20, Ln 34-41; C-22, Ln-19-20; C-24, Ln 60-64; C-25, Ln 5-12). The addition of ZnO dispersions in to the moldings supplies the oxide nanoparticles to the composite thus losing the identity of ZnO dispersion itself.

For the reasons set forth above, applicants composition/process and the products fail to distinguish over the prior art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on 8.30-6.00 Mon-Thu, 8.30-5.00 Alt Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas McGinty can be reached on 571-272-1029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1751

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KMV
June 29, 2006.


Mark Kopec
Primary Examiner